

Corps fish study nets useful data

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New York District

In a New York City conference room with large windows overlooking the Port of New York and New Jersey, Mary Fabrizio, Chief of the Behavioral Ecology Branch of the Northeast Fisheries Science Center, recently presented to scientists the results of an extensive fish tagging study she performed for the U.S. Army Corps of Engineers.

As the study's principal investigator, Fabrizio told the scientists, "The findings will be used to update the Environmental Protection Agency's criteria that determine what dredged material from the port is environmentally safe to place in the Historic Area Remediation Site (HARS)."

After undergoing a series of biological and chemical analyses, dredged sediment from the channels within the Port of New York and New Jersey is placed in the Atlantic Ocean at the HARS if found acceptable as remediation material.

The HARS is an approximately 15.7 square nautical mile area – 3.5 nautical miles east of Highlands, New Jersey, and 7.7 nautical miles south of Rockaway, New York.

Remediation material is used to cover or "cap" the dredged sediment placed there previously that did not meet EPA's current placement standards. This cap remediates the site and improves the habitat conditions for aquatic life in the HARS.

"After consultation with the Corps' New York District, the U.S. EPA Region 2 sets the final criteria for what is suitable for placement in the HARS. Several years ago the EPA indicated they wanted to update this criteria by using a risk-based approach," said Monte Greges, Chief of Dredged Material Management Section, U.S. Army Corps of Engineers, New York District.

"One of the parameters that goes into creating this risk-based criteria is the residency time of fish in the HARS because it is assumed that the more time the fish spend at the HARS, the more organisms they will eat that have been impacted by dredged material placed there."

"The New York District ... initiated and funded a fish tag study to better answer the question of



Scientists disassemble an array that holds the receiver in order to retrieve the data.

how much time the fish actually spent within the HARS boundary," said Greges.

The June 2003 to June 2004 study, managed by the Corps' Engineer Research and Development Center, Waterways Experimental Station in Vicksburg, Miss., included 145 healthy adult fish captured at the HARS. The species captured included 122 black sea bass (*Centropristis striata*) and 23 summer flounder (*Paralichthys dentatus*) or "fluke," both important to recreational and commercial fishing.

The fish were monitored using ultrasonic transmitters surgically implanted in their abdominal cavities. To pick up the signals, 72 receivers were strategically moored throughout the HARS, 800 meters apart.

The receiver electronically decoded and recorded the identification number of the transmitter, the date and the time of the day the signal was detected.

These records were accumulated in the memory of the receiver. When the receiver was retrieved and the data downloaded to a computer, scientists had collected 1.4 million records.

Recent preliminary results on the fishes' use of the HARS habitat, seasonal activity and dispersal out of the HARS, showed that both fish species spent most of their time in the summer in the shallow areas on the ocean floor where the HARS is composed of varying levels of dredged sediment.

Black sea bass exhibited greater activity in the HARS during the summer than during the fall. Summer flounder activity patterns were more complex. All fish were captured and released within the HARS boundaries, but each species moved or "dispersed" out of the HARS at different times and rates. A handful returned to the HARS one year later.

"Deploying and retrieving sensitive acoustic equipment at sea for long periods of time is difficult," Fabrizio said. "Each time we attempted to retrieve the 72 receivers, we usually needed about 10 full days, which we had to schedule around the weather, including Hurricane Isabel in September 2003.

"If I did the study again I would use acoustic receivers with modem capabilities – this allows the scientists on board the vessel to download the information from the receiver's memory without having to retrieve the gear off the bottom of the sea," she said. "However, this equipment was not yet developed when we started our work, and it's very expensive.

"It was also very interesting learning from, and working with the captains of the vessels that assisted us on this study," Fabrizio said.

She said the most important aspect of the field deployments and retrievals of the receivers was the skill of the captain and the capabilities of the vessel.

Griggs said data from this study will benefit both the public and the environment. Scientifically defensible data will be used by the EPA to create the new HARS criteria, a more realistic picture

of human and ecological risk will be ascertained and dredged material that poses an unacceptable risk for introduction into the food chain will not be disposed in the ocean.